August skies: COTS and the geopolitics of spaceflight

The guns of August arise again. A normally quiet, lazy, intermission month, when much of the professional world finds itself checked-in for some rest and relaxation, August has historically bode ominous for East-West relations and geopolitical stability. Both World Wars, the construction of the Berlin Wall, the incident at the Gulf of Tonkin as well as the 1991 attempted Soviet coup occurred in seemingly sleepy August. This year, as the world watches the spectacle of Russian tanks rolling into Georgia, we are reminded that – no – we haven't run out of history yet, and that August is back with a vengeance.

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What next August brings is a page to be written, but this August has brought consternation to a relatively arcane realm - that of space transportation systems and the International Space Station (ISS). Here's where we stand - to keep the ISS operating and in its proper orbit, the partner nations of this massive project must deliver a steady stream of crew rotations and cargo deliveries. By agreement and logistical necessity, these functions are handled jointly, by the US with its Shuttle and by Russia with its Soyuz and Progress spacecraft. (The Europeans too, have a role with their own cargo craft).

Arranged for political reasons in the early 90s, the US-Russian cooperation on these matters has never been completely cozy. Indeed, this intended cooperation stands in especially stark contrast when placed against the US Iran Non-proliferation Act (INA) which, among many things, prohibits NASA from purchasing from Russia the Soyuz vehicles it needs to service the ISS. This continues to be in effect as long as Congress views Russia as continuing to assist Iran's nuclear program. Congress has granted waivers to the INA before - but now, with the US government reviewing the "entire relationship" with a more aggressive Russia, an intended retirement of the Shuttle in 2010 and long delays in the development in its replacement, Orion, reliable human transportation to the ISS is becoming much more precarious.

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Most of politicians' focus on this problem has been on closing the US space transportation gap by either accelerating development of Orion or extending the life of the Shuttle, committing billions of dollars more along the way. Frankly, while this may be a good idea and a political necessity, it should not be our only backstop solution to this problem. The Shuttle is on its last legs and the Orion has development problems that may not survive its next review.

Fortunately, there is another answer, one perhaps more suited to an emerging era of private and commercial development of space.

That answer is COTS or Commercial Orbital Transportation Services, a project by NASA to grant $500 million to develop systems to provide cargo and crew services to the ISS. The idea was that the systems developed would later compete for ISS service contracts. In 2006 and 2008, competitions brought NASA to disburse parts of that $500 million to SpaceX and Orbital Sciences Corporation to each develop spacecraft. Orbital, the experienced hand with many successes under its belt, is developing the Cygnus craft to provide cargo services. SpaceX, the young upstart, is aiming higher with its Dragon system to potentially provide both cargo and crew transport. With some fits and starts, both are now making good progress in bending metal and getting these craft ready for the 2010-11 timeframe. Then they will participate in competitions for ISS services contracts, possibly against other companies that were shut out of NASA COTS money but have decided to develop the systems anyway.

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So – is this a way to help fill the gap and develop commercial participation? As much as the mere existence of the COTS program is a great step forward, it hasn't gotten the top-level attention and respect that it deserves. The money is constantly threatened at the Congressional level and hasn't been taken seriously as a Shuttle replacement. Even more troubling, much of the money is focused on cargo, not crew transportation. The crew portion of COTS, so-called COTS-D, requires considerably more money to make a reality. Moreover, as mentioned above, only SpaceX's offering even promises the possibility of crew capability. Lastly, the $500 million COTS budget is an order of magnitude less than the annual budgets expected for Orion and a Shuttle extension. This is not a serious amount of money versus the stated gap filling mission.

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How do we get serious about this? More money yes, but equally important is incentivizing private investment into COTS participants. NASA can start by providing better leadership on the COTS issue and putting greater attention on making commercial partnerships a reality. NASA can also be more attentive to developing the commercial potential of the ISS laboratories, seeking partners in the biological and materials sciences, ensuring that the transport services have a stronger future market demanding such transport. Further, NASA can encourage private investment in the non-COTS winners (i.e., everyone except SpaceX and Orbital) by providing

some degree of investment matching for private investments greater than some amount, say $50 million, to filter out the less serious and well backed commercial efforts. Another avenue is to find ways to work with Bigelow Aerospace, the inflatable module king which plans its own commercial space station systems, to expand the potential market for COTS services.

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This August, amidst geopolitical clamor, US space policy finds itself in a definitional bind: Can NASA remake itself into a champion of commercial operation and private investment in space transportation? Its past history does not provide us with a very good verdict on that point, but COTS shows it is at least trying. We should all take serious note though: as it currently stands, in a few short years, the US space program could find itself in much the same situation as it was in 1961 when Soviet cosmonaut Gherman Titov made his country's second successful manned spaceflight, with 17 orbits of the Earth. The US, caught flatfooted and watching agape from the ground, had still not accomplished any itself. Coincidentally, that too happened in the month of August.

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